Congress Program

Geomechanics Congress: Recent Advancements in Petroleum Geomechanics

April 18th 2018 | Spring, Texas, USA

Southwestern Energy

SPE International

Gulf Coast Section

Society of Petroleum Engineers

Message From Program Committee

The SPE Gulf Coast Section Geomechanics Congress committee welcomes you to the first congress with special focus on "Recent Advancements in Petroleum Geomechanics". The Geomechanics Congress is convened in an effort to disseminate technical knowledge related to oil field geomechanics to SPE members. The main objective is to provide attendees with an opportunity to learn and discuss, with highly recognized speakers, the latest trend in petroleum geomechanics as well as leading edge technological developments.

The congress contains one keynote speaker and 12 technical presentations which are spread between four disciplines including:

1) Exploration Geomechanics,
2) Drilling Geomechanics,
3) Completion Geomechanics, and
4) Production Geomechanics.

This congress is an excellent opportunity for attendees to discover the impact of geomechanics on all E&P activities. It is also an outstanding chance to discuss recent technical/operational challenges and possible solutions with your geomechanics peers to advance your goals.

Again, welcome and enjoy the congress.

Reza Safari, Weatheford International Ltd.,
Program Committee Chairperson.

Vahid Serajian, Edge Geoscience Inc.,
Program Vice Chair and Treasurer.

Deepak Gokaraju, MetaRock Laboratories,
Communications Chair.

Lisa Dell'Angelo, Southwestern Energy,
Committee Advisor and Venue Liaison.

AGENDA Wednesday April 18th Morning	
7:30 AM – 8:20 AM	Registration/Breakfast
8:20 AM – 8:30 AM	Welcome and Safety Briefing
8:30 AM – 9:15 AM	Keynote Speaker, **Mohamad Soliman** **University of Houston**
9:15 AM – 9:40 AM	Using geomechanics earlier in the life cycle, **Peter Connolly** **Chevron**
9:40 AM – 10:05 AM	Salt flow and deformation of reservoir intervals within layered evaporate sequences over geological time scales: Insights from geomechanical forward modeling, **Rajesh Goteti** **ARAMCO Services**
10:05 AM – 10:30 AM	Implications of new stress mapping for oil and gas production in tight formations, **Jens-Erik Lund Snee** **Stanford University**
10:30 AM – 10:45 AM	First Break/Networking
10:45 AM – 11:10 AM	Drill bit Geomechanics: Providing the Data Needed for Mechanical Studies, **Carrie Glaser** **FractureID**
11:10 AM – 11:35 AM	Pore pressure prediction and wellbore stability analysis to reduce drilling risks, **Jon** **Jincai Zhang** **Sinopec**
11:35 AM – 12:45 PM	Lunch/Networking

AGENDA Wednesday April 18th Afternoon	
12:45 PM – 1:10 PM	Mapping reservoir stress conditions using hydraulic fracturing microseismicity, **Orlando J. Teran** **Microseismic Inc.**
1:10 PM – 1:35 PM	Geomechanical effects on the efficiency of plug&perf completions in Unconventional wells, **Alexei A. Savitski** **Shell Exploration and Production**
1:35 PM – 2:00 PM	How much do proppants contribute to production in unconventional resources, **Shugang Wang** **Chevron**
2:00 PM – 2:25 PM	Geomechanical Modeling of Asymmetric Hydraulic Fracture Height Propagation in a Multilayered Rock Using Damage Mechanics and the Material Point Method, **Arman K. Nejad** **FracGeo**
2:25 PM – 2:45 PM	Second Break/Networking
2:45 PM – 3:10 PM	Well Productivity Enhancement: From Reservoir Geomechanics to Near-Wellbore Geomechanics, **Rene Alcalde** **BHP Billiton**
3:10 PM – 3:35 PM	Utilizing 3D Geomechanics Models to Evaluate and Influence Production and Injection Operations, **Neal Nagel** **Oilfield Geomechanics**
3:35 PM – 4:00 PM	Coupled Reservoir/Geomechanics/Stimulation Modeling Workflow to Forecast and Mitigate Infill Degradation, **Nicolas P. Roussel** **ConocoPhillips**

Dr. Jens-Erik Lund Snee

Jens-Erik Lund Snee is a Ph.D. Candidate at the Department of Geophysics at Stanford University, where he works with Professor Mark D. Zoback in the Stress and Crustal Mechanics Group and the Stanford Center for Induced and Triggered Seismicity. Lund Snee and Zoback are building a detailed map of the orientations and relative magnitudes of the principal stresses across the south-central USA. Using these new data, they are estimating the slip potential on mapped faults across major oil- and gas-producing basins in Texas and New Mexico, and they are studying impacts of mapped variations in the stress field for petroleum field development.

Lund Snee previously worked as an Exploration Geologist for Statoil, where he conducted regional oil and gas exploration and prospect evaluation in a deepwater setting. He holds a Masters in Geological and Environmental Sciences, also from Stanford University. For his Masters research, he worked with Professor Elizabeth Miller to map stratigraphic relationships in a syn-extensional volcanic and sedimentary basin in northeast Nevada, USA, supported by geochemical and geochronologic analyses. He has also conducted research on fault zone architecture during a Fulbright Fellowship at the University of Otago, New Zealand, where he studied the kinematic history and internal structure of a fault zone in the Australian Plate footwall of the Alpine Fault.

Talk Title: ***Implications of new stress mapping for oil and gas production in tight formations***

Abstract:

As part of our work to map the state of stress across the central USA, our group has recently compiled nearly 400 new orientations the maximum horizontal stress (SHmax), together with information on relative principal stress magnitudes. Our new data show dramatic but coherent rotations of SHmax across several tight oil and gas basins, most notably in the Delaware basin. SHmax rotates more gradually across other areas, including the Denver, Fort Worth, Anadarko, Arkoma, Gulf Coast, and Appalachian basins. In all of these basins, we also observe gradual variations of relative stress magnitudes. Together, these variations of SHmax orientation and relative principal stress magnitude have important implications for oil and gas operations. The stress measurements allow operators to predict the orientations of horizontal wells so that hydraulic fractures propagate normal to least principal stress, and to better understand which pre-existing fracture sets will slip and become permeable during hydraulic stimulation. We demonstrate how the stress maps, when paired with information about pore pressures and rock properties, can be used to improve hydrocarbon development operations.